



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,456	04/22/2005	Liberty L. Gunter	20030213-US	3920
42716	7590	09/21/2007		
Vern Maine & Associates P. O. BOX 3445 NASHUA, NH 03061			EXAMINER JEFFERSON, QUOVAUNDA	
			ART UNIT	PAPER NUMBER
			2823	
			MAIL DATE	DELIVERY MODE
			09/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

BJ

Office Action Summary	Application No. 10/532,456	Applicant(s) GUNTER ET AL.	
	Examiner Quovaunda Jefferson	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,8-14 and 21-26 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21 is/are rejected.
- 7) ☒ Claim(s) 1, 3-6, 8-14, and 22-23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Parikh et al, US Patent Application 2003/0015708 (as previously cited) in view of Chinn et al, US Patent Application Publication 2004/0023508 and Previti-Kelly, US Patent 5,006,488 (as previously cited).

Regarding claim 21, Parikh teaches a method for fabricating an etched grooved GaN-based permeable-base transistor device, comprising of opening a window for a base recess, opening a window for RF test pad metallization using optical lithography, depositing RF test pad metallization layer, thereby providing RF test pads **55a** ([0049] Note: Parikh teaches the use of a dry etch, RIE, to etch the base layer. It is well-known in the art that RIE etching uses a photoresist with an opening window that is used to designate in which areas the etching process is to take place); and etching to recess a base layer to an n- GaN quasi-substrate layer **53** grown on the n+ GaN quasi-substrate layer **52**. In addition, Parikh teaches the formation of ohmic metal contacts **55a, 55b**. These contacts could then be connected to a test pads and connected to a

Art Unit: 2823

testing apparatus to determine if the transistor works by sending RF power to the transistor).

Parikh fails to teach the etching is performed with a ramp down in chuck bias voltage and forming the test pad metallization by a lift-off process.

However, Chinn teaches the etching is performed with a ramp down in chuck bias voltage [0015] by teaching that process variables may be varied, by ramping up or ramping down, or keep constant during the production process. One reasoning behind the varying of process variables during production is to quench relatively high concentration of etch species to obtain good anisotropic etching conditions.

It would be obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Chinn with that of Parikh because varying process variables during manufacturing productions quenches relatively high concentration of etch species to obtain good anisotropic etching conditions

Parikh and Chinn fail to teach forming the test pad metallization by a lift-off process.

Art Unit: 2823

Previti-Kelly teaches forming the test pad metallization by a lift-off process (figures 1-4) as a commonly employed method for better selectivity deposition for metallic deposition.

It would be obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Previti-Kelly with that of Parikh and Chinn because a lift-off technique is a commonly employed method for better selectivity deposition for metallic deposition.

Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter:

Regarding independent claim 1, prior art fails to teach opening a window for a collector contact pad, using optical lithography, depositing a high quality silicon nitride layer over the window for a collector contact pad, and lifting off or wet etching the high quality silicon nitride layer, thereby forming a silicon nitride collector contact pad. Claims 3-6, 8-14, and 23-26 are dependent upon claim 1 and are therefore allowable.

Regarding claim 22, prior art fails to teach depositing conformal silicon nitride for passivation of the recessed base layer and directionally etching to remove silicon nitride

Art Unit: 2823

on planes parallel to the n^+ GaN quasi- substrate layer. Claims 23-26 are dependent upon claim 1 and are therefore allowable.

Response to Arguments

Applicant's arguments, see page 6, filed June 26, 2007, with respect to 35 USC 112, 2nd Paragraph rejections of claims 3, 6, 8, 12, 14, 22-24, and 26 have been fully considered and are persuasive. The 35 USC 112, 2nd paragraph rejections of claims 3, 6, 8, 12, 14, 22-24, and 26 has been withdrawn.

Applicant's arguments, see page 7, filed June 26, 2007, with respect to Objections of claims 1 and 22 have been fully considered and are persuasive. The Objections of claims 1 and 22 has been withdrawn.

Applicant's arguments with respect to claim 21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 6,501,503, issued to Bhardwaj et al, discloses method of surface treatments of semiconductor substrates.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quovaunda Jefferson whose telephone number is 571-272-5051. The examiner can normally be reached on Monday through Friday, 7AM to 3:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QVJ
QVJ


FERNANDO L. TOLEDO
PRIMARY PATENT EXAMINER